CLAIMS

1. A method for controlling transfer of electrically charged particles of a medication powder, intended for inhalation, emitted from a particle generator to at least one defined target are of an electrostatic chuck member in a dose forming process, comprising the steps of

arranging a particle transfer electrode member forming an electric iris diaphragm/shutter such that at least one electrode being a part of the iris diaphragm/shutter with its associated electric field operating to transfer charged particles, emitted from the particle generator, to the defined target area or areas of said electrostatic chuck member, controlling direction and speed of particles, in said dose forming process;

locating said electric iris diaphragm/shutter between said particle generator and said electrostatic chuck member such that all particles must pass the iris diaphragm/shutter in order to be transferred to the electrostatic chuck member.

2. The method according to claim 1, comprising the further step of arranging said electrostatic chuck such that its target area or areas will face downwards during the dose forming process and with the electric iris diaphragm positioned beneath this chuck in between said electrostatic chuck member and said generator of charged particles, thereby using the force of gravitation to obstruct big, heavy particles from being transferred in the created electric field from a cloud of charged particles created by the generator through the iris diaphragm to the target area or areas of the electrostatic chuck member.

3. The method according to claim 1, comprising the further step of forming an electric iris diaphragm containing an isolating wafer member and at least one electrode for controlling on one hand transfer of charged particles through the at least one aperture and on the other hand distribution of particles on one or more target areas of said electrostatic

chuck member; a total thickness of said iris diaphragm being in a range of 0,07 – 2,5 mm, the at least one electrode having at least one aperture with a main measure in the range of 50 – 5000 μm; the ratio between total thickness and average aperture diameter always being less than 10 and preferably less than 3, where the average aperture diameter is defined as the sum of the two main measures of the aperture divided by two.

4. The method according to claim 3, comprising the further step of using as said iris diaphragm/shutter a flexible or rigid printed circuit board.

5. The method according to claim 1, comprising the further step of positioning said electrostatic chuck member at a distance of 0,1 – 5 mm from a side of said electric iris diaphragm/shutter facing the electrostatic chuck member.

6. The method according to claim 1, comprising the further step of applying quasi-stationary potentials to electrode members forming said electric iris diaphragm/shutter to switch a flow of charged particles on or off in the dose forming process.

7. The method according to claim 5, comprising the further step of applying quasi-stationary potentials to electrode members forming said electric iris diaphragm/shutter to thereby adjust a mass flow per unit time of charged particles in the dose forming process.

8. The method according to claim 1, comprising the further step of applying quasi-stationary potentials to electrode members forming said electric iris diaphragm/shutter thereby controlling the size of the aperture or

apertures of the iris diaphragm/shutter setting an area of a flow stream of charged particles in the dose forming process.

9. The method according to claim 1, comprising the further step of frequently removing electrical charge from the dose or doses and the respective target area or areas of the electrostatic chuck by introducing neutralizing charges from a source member such that a repelling electric field from deposited particles is nullified.

10. The method according to any of the preceding claims, comprising the further step of using one or more ion sources to make electric contact without physical contact with one or more electrodes on a back side of said electrostatic chuck, in order to connect one or more controlled potentials to electrodes thus creating one or more necessary electric fields emanating from the electrodes for transportation of charged particles to the target area or areas in the dose forming process.

11. A method for controlling transfer of electrically charged particles of a medication powder, intended for inhalation, emitted from a particle generator to one or more defined target areas of an electrostatic chuck in a dose forming process, comprising the steps of

screening electrically charged particles of a medication powder during a dose forming process by superimposing an AC electric field onto an existing quasi-stationary field by applying an AC potential on at least one electrode of electrodes forming an electric iris diaphragm/shutter;

adjusting amplitude and frequency of said AC potential and thereby the electric field such that small, light, charged particles will oscillate in the created AC electric field, such that only small, light particles emerge from the iris diaphragm/shutter and will be transferred further in the dose forming process.

12. A method for controlling transfer of electrically charged particles of a medication powder, intended for inhalation, emitted from a particle generator to one or more defined target areas of an electrostatic chuck member in a dose forming process, comprising the steps of

controlling porosity of one or more doses of the medication powder while a dose or doses are being formed in the dose forming process by superimposing an AC electric field onto an existing quasi-stationary field by applying an AC potential on at least one electrode behind the defined target area or areas of the electrostatic chuck member where powder particles comprising a dose are to be distributed in the dose forming process;

adjusting amplitude and frequency of said AC potential such that a majority of charged particles emerging from an electric iris diaphragm/shutter are accelerated and retarded in synchronism with an AC electric field created, such that they impact on the defined target area or areas of the electrostatic chuck member with a relatively low speed and momentum resulting in an intended dose porosity.

13. A particle transfer control device for controlling the transfer of electrically charged particles of a medication powder emitted from a particle generator to one or more defined target area or areas of the electrostatic chuck member in a dose forming process, wherein

an electric iris diaphragm/shutter in a range of 0,07 – 2 mm in thickness, comprises at least one electrode with at least one aperture having a general measure in a range of 50 – 5000 μm and has ratio between total thickness and average aperture diameter always being less than approximately 10, whereby an average aperture diameter is defined as a sum of two general measures of said aperture divided by two for the purpose of bringing about electric control of on one hand transfer of charged particles through the at least one aperture and on the other hand distribution of

particles onto the defined target area or areas of the electrostatic chuck member in the dose forming process;

said electrostatic chuck member having the defined target area or areas is intended for at least one pre-metered medicament dose;

an electrode behind each individual target area of said electrostatic chuck member generates a defined electric field when connected to a suitable, controlled voltage source with or without a superimposed AC voltage, such that an electric field catches and directs particles emitted from the iris diaphragm/shutter to the target area or areas of the electrostatic chuck member.

14. The device according to claim 13, wherein said electrostatic chuck is arranged such that its target area or areas will face downwards during the dose forming process and with said electric iris diaphragm positioned beneath the chuck in between said electrostatic chuck member and said generator of charged particles, thereby using a force of gravitation to obstruct big, heavy particles from being transferred in a created electric field from a cloud of charged particles created by the generator through the iris diaphragm to the target area or areas of the electrostatic chuck member.

15. The device according to claim 13, wherein said target area or areas of said electrostatic chuck member are pre-charged such that a pre-charge completely or partly in combination with an electric field from an electrode, when used, behind each individual target area creates a necessary electric field, which catches and directs particles emitted from the iris diaphragm/shutter to the target area or areas of the electrostatic chuck member.

16. The device according to claim 13, wherein quasi-stationary potentials applied to electrode members of said electric iris diaphragm/shutter create

electric fields capable of switching a flow of charged particles on or off in the dose forming process.

17. The device according to claim 13, wherein quasi-stationary potentials applied to electrode members of said electric iris diaphragm/shutter create electric fields capable of controlling a mass flow per unit time of charged particles in the dose forming process.

18. The device according to claim 13, wherein quasi-stationary potentials applied to electrode members of said electric iris diaphragm/shutter create electric fields capable of controlling an apparent size of the aperture or apertures of the iris diaphragm thereby defining an area of a flow stream or flow streams of charged particles in the dose forming process.

19. The device according to claim 13, wherein electrical charge is frequently removed from formed dose or doses and corresponding target area or areas of said electrostatic chuck member by introduction of neutralizing charges from a source member such that a repelling electric field from deposited particles is nullified.

20. The device according to claim 13, wherein an ion source is used to make electric contact without physical contact with one or more electrodes on a back side of said electrostatic chuck member, in order to connect a controlled potential to its electrodes thereby creating or assisting in creating a necessary electric field emanating from the electrodes for transportation of charged particles to the target area or areas in the dose forming process.